Teamfight Tactics Team Composition Analysis and Prediction

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**Objective and Motivation**

**Objective:** This study endeavors to construct a predictive model designed to forecast game outcomes by meticulously scrutinizing both player decisions and game-related data. The primary objective is to pinpoint the most advantageous choices that not only elevate unit performance but also foster favorable game results. Through an intricate examination of the interplay between player decisions and contextual game data, this research aims to illuminate the strategic decision-making processes within gaming environments. Moreover, the ultimate goal is to equip players with the knowledge and strategies necessary to secure a coveted first-place finish or a position within the top four contenders in the game, thereby enhancing their overall gaming experience and competitive performance

**Motivation**: The driving force behind this endeavor is to unravel the pivotal secrets necessary for achieving victory in Teamfight Tactics. With the game presenting players with an abundance of options at every turn, each choice carrying the potential to significantly impact the outcome, there exists a compelling need to delve deeper into the strategic intricacies of the game. By understanding the diverse array of choices available to players and the unique ramifications of each decision, this research seeks to illuminate the pathway to success in Teamfight Tactics, offering invaluable insights into the complex dynamics that govern optimal gameplay strategies.

**Data**

We will be gathering data from the Riot Developer API. We will get summoner IDs from the Grand Master league, use those to find match histories, and then gather data about team comps and their respective placements from those individual matches. Finally we will aggregate this data into a one hot encoded data frame where our features are the various Units, Augments, and Traits that make up one’s team composition and our target variable will be match placement.

**Feature Variables**

Trait:

Trait number

Trait type

Augment:

Augment level:(Silver,Gold, Prismatic)

Augment type: (Combat, Economy, Re-Roll)

Headliner

Item

Damage Item:

Ability power

Attack damage

Defense Item:

Magic Resist

Armor Resist

Support Item

Ornn Item

Emblem Item

Radiant Item

Rank level

Team Set

Population Level

**Target Variable**

Position (1st - 8th)

**Methods Overview**

We will visualize and analyze the data based on usage and win rate. For example, we will visualize the team compositions that have the highest win rates, or the positions of the best team compositions. The positions are the placements of the player, 1 through 8, where 1 is the first place, and the top four players are considered the winners. The team compositions include the combinations of champions, augments, traits, and items that the player has. Through these analyses we expect to see which team compositions are considered most powerful and see common trends among the top team compositions.

In addition to visualization and analysis, we will create a prediction model that returns the predicted position based on the team composition. This model will be based on the data from matches, incorporating the positions based on the team compositions that lead the player to victory. It will consider every aspect of the team compositions, from champions to items to return the predicted final position of the player.

We will use Python to access and visualize the data, as well as create the model. We plan to use various Python libraries, including but not limited to, NumPy, Pandas, and Matplot. Python will also be used to access the data through the API, as well as for data cleaning and data processing.